Structural Budget Balance and Fiscal Stance in Turkey

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STRUCTURAL BUDGET BALANCE AND FISCAL STANCE IN TURKEY[1]

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Abstract

Fiscal policy not only affects macro and micro balances in the economy but also is affected by changes in the economy through automatic fiscal stabilizers. The latter feature of fiscal policy requires a different approach in analyzing budget deficits, a main gauge of assessing fiscal performance, and in maintaining a more realistic fiscal stance. Assessing fiscal policy from a more rational perspective and determining whether it is used as a discretionary stabilizing instrument requires the calculation of a cyclically adjusted budget balance. This study aims to position the fiscal stance for 2006-2010 in Turkey by calculating the structural budget balance and determine the extent to which budget balance is affected by cyclical movements.

In this study, where the structural budget balance is calculated in three stages; firstly, the sensitivity of budget items to national income is estimated; secondly, potential national income series are obtained; and lastly, the structural budget balance is calculated.

Findings of the study are briefly as follows: the weighted tax elasticity coefficient for the Turkish economy is estimated to be 1.07. The share of structural primary budget surplus in GDP has declined in the recent years. Fiscal policy is observed to be procyclical in 2007, counter-cyclical in 2009 and acyclical in 2008 and 2010. Fiscal authority gave more importance to economic stabilization in 2009 due to global financial crises.

Key words: Fiscal Policy, Structural Budget Balance, Fiscal Stance

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1. Introduction:

Fiscal policy not only affects macro and micro balances in the economy but also is affected by changes in the economy through automatic fiscal stabilizers. The latter feature of fiscal policy requires a different approach in analyzing budget deficits, a main gauge of assessing fiscal performance, and in maintaining a more realistic fiscal stance. Thus, the use of cyclically adjusted budget balance (CABB) numbers instead of actual budget numbers is essential to assessing fiscal performance. The cyclically adjusted budget balance is also important in determining whether fiscal policy plays a discretionary stabilizing role for the economy.[4]

Changes in the economy affect budget revenues and budget spending through automatic stabilizers. For example, an increase in national income may not only positively affect (add to) budget revenues through tax revenues without government discretion but also reduce budget spending depending on the presence and prevalence of unemployment benefits in the current system. In this sense, automatic stabilizers in the system assume the spontaneous role of counter cyclical fiscal policy; in other words, they restrict the negative effects of cyclical fluctuations on economy. The structure and legal aspect of automatic stabilizers also determine how and when fiscal policy will respond to the changes in economy. Hence, automatic stabilizers allow fiscal policy to play a fast and efficient stabilizing role for the economy without giving way to inherent decision and implementation lags of the discretionary fiscal policy.[5]

Assessing fiscal policy from a more rational perspective and determining whether it is used as a discretionary stabilizing instrument requires the calculation of a cyclically adjusted budget balance. Cyclically adjusted budget balance is obtained after subtracting the components of budget items that are sensitive to cyclical fluctuations from actual budget balance. In other words, cyclically adjusted budget balance is the budget balance when the actual national income becomes equal to the potential output.

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[4] The overall aim of fiscal policy is to maintain the sustainability of debts, full employment, economic progress and growth, fair distribution of income and wealth, a cyclically adjusted and stable economic structure and price stability.

[5] The legal framework of automatic stabilizers (tax tariffs, tax rates, tax payment due dates, etc.) is the most important factor that determines the type and time of the automatic response the fiscal policy will offer to changes in the economy. Moreover, factors such as tax structure (the share of each tax item in total revenues), tax and spending elasticity, magnitude of public sector are important in measuring the stabilizing role of automatic stabilizers.

The most common method in calculating cyclically adjusted budget balances is the three-step estimation method, a.k.a. the OECD approach, used by Girouard and André (2005). Firstly, the tax and expenditure elasticity of budget items sensitive to national income is obtained. Secondly, potential output series are estimated. Finally, using the information from the first two steps, the cyclically adjusted (structural) budget balance is obtained after subtracting the calculated budget figures that are sensitive to cyclical movements from actual budget figures. The aim of this study is to estimate the cyclically adjusted budget balance (based on the central government budget) for 2006-2010 and to position the fiscal stance in Turkey, which is excluded from the abovementioned study despite being an OECD member.

The second part of the study gives a brief literature review and the third part of the study contains a mathematical model of the structural budget balance. The fourth part focuses on the estimation of structural budget balance, analyzes the sensitivity of budget items relative to economic activity, and shows elasticity estimations based on tax types, respectively. Also in this section, potential output series and structural budget balance are calculated, the latter by using the method mentioned in the previous section. The fifth part discusses the findings while the last part contains the conclusion and assessments.

2. Literature Review:

Since fiscal discipline is a prerequisite for sustainable economic growth, it is important to conduct a healthy medium-to-long term analysis of fiscal policy and budget balance. In this sense, after subtracting the effects of cyclical movements such as recession and excess growth on budget, structural budget balance provides valuable insight into the medium and long term quality of fiscal policy. Moreover, estimating the impact of cyclical movements on budget balance is important for short-term macroeconomic analysis. Thus, it should not be surprising when international organizations like the OECD and IMF or institutions such as finance ministries and central banks calculate and involve structural budget balance in policy analysis.

Although the methods developed and used by the above organizations and institutions for estimating structural budget balance may vary, a common tendency is to develop a three-step estimation method:

1) Determining the budget expenditure and revenue items that are sensitive to cyclical movements, and estimating the national income elasticity of tax revenues,

2) Developing potential output and output gap series in order to determine the cyclical movements,

3) Subtracting revenue and expenditure items driven by cyclical movements from the actual budget balance.

One of the most fundamental studies about estimating structural budget balance is the IMF method, a detailed review of which can be found in Hagemann (1999). The study's approach of letting tax revenues get wholly affected by cyclical movements and calculating cyclical movements with output gap is also followed by current studies such as the Congressional Budget Office (2009) and Fedelino et al. (2009). However, studies based on the possibility that different tax bases may get affected to various degrees by cyclical movements estimate the structural component of each tax revenue and reach the structural budget balance by aggregating these estimates. Bouthevillain et al. (2001) adopted this approach in their study for the European Central Bank. Based on this approach, Debrun (2006) uses econometric methods in calculating tax revenue elasticity, while Girouard and André (2005), also known as the OECD method, estimates income tax elasticity by using data on income distribution and earnings. This study also focuses on structural fiscal reforms, thereby offering a panel study for OECD member states.[6] The OECD method is the most common method used in studies calculating the structural budget balance, such as Turner (2006) and Lizondo et al. (2006). Assuming that unemployment benefits, an expenditure item, might get affected by cyclical movements, Branconier and Forsfalt (2004) inserted unemployment gap into the analysis and claimed that it would be more appropriate to do so in economies where unemployment spending makes up a larger share of the budget.

Even though structural budget balance gives hints on the quality of fiscal policy and the sustainability of fiscal discipline over the medium to long term, it is criticized in some studies. Chalk (2002) states that it is difficult to measure the sensitivity of budget revenue items with respect to cyclical movements and there may not be a linear relationship between two variables. Larch and Salto (2005) emphasize that structural budget balance may deliver seriously misleading results if potential output, thus output gap, is not measured accurately.

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[6] Despite being members of OECD, Turkey and Mexico are excluded from this study due to lack of data.

In view of these arguments, this study adopts the method used in Girouard and André (2005), a.k.a. the OECD methodology. In contrast to that study, we used the Bouthevillain et al. (2001) approach, i.e. the European Central Bank methodology, to estimate the elasticity of indirect taxes, the reasons of which are discussed in the fourth part. We used two different output gap series because of the sensitivity of structural budget balance calculations to potential output estimates, and saw that the obtained results were not significantly different.

3. Mathematical Model:

The cyclically-adjusted budget balance calculated by using Van den Noord (2000) and Girouard & André (2005) is illustrated as follows:

$$b^{**} = b - b^*$$

b = actual budget balance (in ratio to output level)

b^* = cyclically-adjusted budget balance (in ratio to potential output level)

b^{**} = cyclically-sensitive budget balance

$$b^* = \left[\left(\sum_{i=1}^{4} T_i^* \right) - G^* + X \right] / Y^*$$

G^* = cyclically-adjusted budget expenditures

T_i^* = cyclically-adjusted budget revenues (i type of revenue)

X = budget items not sensitive to cyclical changes

Y^* = potential output level

Cyclically-adjusted budget items $\left(T_i^*, G^* \right)$ are obtained by adapting actual budget figures $\left(T_i, G \right)$ to the potential output level-to-actual output level ratio $\left(Y^* / Y \right)$ and budget elasticities $\left(\varepsilon_{t_i,y}, \varepsilon_{g,y} \right)$.

$$T_i^* = T_i \left(Y^* / Y \right)^{\varepsilon_{t_i,y}}$$

$$G^* = G \left(Y^* / Y \right)^{\varepsilon_{g,y}}$$

T_i = actual budget revenues (i type of revenue)

G = actual budget expenditures

$\varepsilon_{t_i,y}$ = short-term elasticity of budget revenues (i type of revenue) to output gap

$\varepsilon_{g,y}$ = short-term elasticity of budget expenditures to output gap

Based on the above mathematical illustrations, the cyclically-adjusted budget balance is rewritten as follows:

$$b^* = \left[\left(\sum_{i=1}^{4} T_i \left(Y^*/Y\right)^{\varepsilon_{t_i,y}}\right) - G\left(Y^*/Y\right)^{\varepsilon_{g,y}} + X\right]/Y^*$$

The cyclically-sensitive budget balance $\left(b^{**}\right)$, on the other hand, can be described as follows:

$$b^{**} = b - b^*$$

$$b^{**} = \left[\left(\sum T_i - G + X\right)/Y\right] - \left[\left(\sum_{i=1}^{4} T_i \left(Y^*/Y\right)^{\varepsilon_{t_i,y}}\right) - G\left(Y^*/Y\right)^{\varepsilon_{g,y}} + X\right]/Y^*$$

$$b^{**} = \frac{1}{Y}\sum_{i=1}^{4} T_i \left[1 - \left(\frac{Y^*}{Y}\right)^{\varepsilon_{t_i,y}-1}\right] - \frac{G}{Y}\left[1 - \left(\frac{Y^*}{Y}\right)^{\varepsilon_{g,y}-1}\right] + \frac{X}{Y}\left[1 - \left(\frac{Y^*}{Y}\right)^{-1}\right]$$

4. Calculating Structural Budget Balance:

4.1- Estimating the Sensitivity of Budget Items to Economic Activity:

Estimating the sensitivity of budget items relative to economic activities requires separate elasticity calculations with respect to budget revenues and expenditures, depending on the presence and structure of automatic fiscal stabilizers. This study measures the elasticity of tax revenues that account for about 80% of total budget revenues, and assumes zero elasticity for all the remaining revenue and expenditure items.[7] Put differently, this study is

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[7] Expenditure items that are sensitive to economic activity can be considered as central government budget transfers to social security institutions and duty losses. In times of economic contraction, premiums to social security institutions decrease due to higher jobless count and therefore the system incurs a deficit. These deficits are financed by the central government budget. Many studies in the literature show that expenditure elasticity

based on the assumption that automatic stabilizers work only through the tax channel in Turkey.

The tax elasticity coefficients that measure the sensitivity of tax revenues with respect to output level (or output gap) are calculated separately for four different tax categories (i=4). These items can be listed as indirect taxes, income tax on wages, income tax on non-wage revenue items and corporate taxes.[8] Our elasticity calculations are based on both the legal tax structure (tax tariff, tax rate etc.) and econometric estimation methods. We basically used the OECD methodology in our calculations and introduced a two-step procedure.[9] In the first step, the elasticity coefficient $(\varepsilon_{t,tb})$ between tax proceeds (T) and tax base (TB) is obtained by using the legal tax structure (tax rates and amount of income), and, in the second step, the relationship $(\varepsilon_{tb,y})$ between tax base and Gross Domestic Product (GDP) or output gap is obtained by using econometric estimation methods. These elasticity coefficients are multiplied by each other to reach the following total tax elasticity $(\varepsilon_{t,y})$:

$$\varepsilon_{t,y} = \varepsilon_{t,tb} * \varepsilon_{tb,y} = \left(\frac{\partial T}{\partial TB} \frac{TB}{T} \right) * \left(\frac{\partial TB}{\partial Y} \frac{Y}{TB} \right)$$

For income tax, we used the OECD methodology, whereas for elasticity calculations regarding indirect tax, we used both the OECD and the European System of Central Banks (ESCB) methodologies. The ESCB methodology requires the relationship between tax collection and the associated macroeconomic variable to be estimated by using an econometric method.[10] In other words, in contrast to the OECD methodology, this approach facilitates an elasticity estimation via a macro variable (e.g. private consumption, labor payments, operating surplus, etc.) that is smaller than national income without using national income or output gap, and prioritizes the composition effect to show that the effects of national income components on budget variables can differ.[11]

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values are extremely low. For example, Van den Noord (2000) estimated the elasticity of current primary expenditure to output level at an average of –0.30 for selected OECD countries, while Girouard & André (2005) estimated the elasticity of current primary expenditure to output gap at an average of –0.10, –0.11 and –0.06 for OECD countries, the euro area and new EU member states, respectively.

[8] The tax revenues mentioned in this study include all tax items in the central government budget except taxes on property (tax on motor vehicles and inheritance and gift tax).

[9] For the OECD methodology, see Giorno et al. (1995), Van den Noord (2000) and Girouard & André (2005).

[10] For the European System of Central Banks methodology, see Bouthevillain et al. (2001).

[11] For instance, the positive impact of a domestic demand driven real GDP growth on budget revenues is expected to be greater than that of an external demand driven real GDP growth.

In this study, when calculating the cyclically adjusted budget balance, indirect tax elasticity is estimated to be 0.94, income tax (wage) elasticity to be 1.5, and corporate tax and non-wage income tax elasticity to be 1.2 (Table 1).[12] After taking into account the share of each tax item in total tax revenues, the weighted tax elasticity coefficient is found to be 1.07 for 2009 (Table 2). Elasticity calculations for each tax category are discussed below.

4.1.1- Income Tax

Income tax is divided into two categories: income tax on wages and non-wage income tax, and tax elasticity is estimated separately for both categories. Based on the OECD methodology, the income tax (wage) elasticity is estimated in two stages. In the first stage, the elasticity coefficient between tax proceeds and the tax base is calculated with respect to the income tax tariff and the income information about compulsorily insured persons in SSI coverage (active insured).[13] In this context, firstly, for every average income value, an average tax rate is calculated based on the progressive income tax tariff; then, the marginal tax rate (the legal tax rate that applies to the tax brackets in the income tax tariff) is divided by the average tax rate to find the elasticity coefficient.[14,15] In the last stage, the weighted income tax elasticity coefficient is calculated by weighting the coefficients that are obtained by dividing the elasticity values found for every average income value and measured based on one wage-earner, the tax proceeds corresponding to that income value (tax amount * number of wage-earners), by total tax proceeds. Thus, the revenue elasticity of the weighted income tax calculated for wage-earners is estimated to be 2.[16] This coefficient means that if the income

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[12] In this study, the cyclically adjusted budget balance is estimated for 2006 – 2010, and elasticity values measured for each tax revenue item are assumed to remain stable throughout this period.

[13] The elasticity calculation is based on the 2008 income tax tariff and the income range table for December 2008 regarding the compulsorily insured persons in SSI coverage. Moreover, the elasticity calculation does not cover government officials. However, considering that the number of compulsorily insured persons in SSI coverage and of government officials in Pension Fund coverage was 8,802,989 and 2,464,206, respectively, in 2008, an elasticity calculation based on the compulsorily insured persons in SSI coverage is believed to be a good indicator in representing the whole.

[14] The steps involved in estimating the average tax rate can be summarized as follows: Firstly, in order to find the income tax base, the SSI workers' share of 14% and the Unemployment Insurance Fund's share of 1% are subtracted from each gross average income value. Later, the tax amount to be paid for each income value is estimated based on the income tax tariff and the minimum living allowance (MLA) available only to wage-earners. The calculated tax amount is divided by the income tax base to obtain average tax rates.

[15] For estimating the revenue elasticity of income and consumption taxes, see Creedy and Gemmell (2004).

[16] While estimating elasticity, the MLA available to wage-earners from 1/1/2008 is taken into account. While calculating the MLA base, a 4-person family that is considered to represent the average Turkish family (a non-working spouse and two children) is included. In addition, the fact that the number of insured women accounts for 23% of all the insured people in 2008 is taken into account in terms of working and non-working spouses when estimating the MLA base. In the estimation disregarding the MLA, the elasticity coefficient is found to be 1.2.

tax base increases by 1% the tax amount (tax proceeds) to be paid will increase by 2%.[17] With a similar approach, Girouard & André (2005) found this coefficient to be 1.8 on average for OECD countries and 2 on average for the euro area.[18]

In the second stage of calculating elasticity for wage-earners, the relationship between tax base (labor payments) and economic activity (output gap) is analyzed through the econometric estimation method. In this context, based on Girouard & André (2005), the following equation is estimated by using the Least Squares Method (LSM):

$$\partial \ln\left(W_t L_t / Y^*_t\right) = \varepsilon_{wl,y} \partial \ln\left(Y_t / Y^*_t\right) + u_t$$

In the above equation, ∂ shows that the first difference of the series is taken, while u_t stands for the error term. WL represents wage payments, Y is output (GDP), and Y^* is potential output.[19] The $\varepsilon_{wl,y}$ coefficient shows the short-term elasticity of wage payments relative to output gap. Estimated results show that the value of this coefficient is 0.8.[20] This figure is close to the OECD average of 0.7.[21]

As described above, the total income tax elasticity coefficient can be obtained by multiplying two different elasticity values. Thus, the total income tax elasticity for wage-earners is estimated to be 1.5 (1.959*0.76=1.49). Girouard and André (2005) found this coefficient to be an average of 1.3 for OECD, 1.5 for the euro area and 1.1 for new EU members.

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[17] Factors that cause the elasticity to get higher values can be listed as follows: 1) Due to the people who earn more than minimum wage but officially appear to earn minimum wage, the first wage ranges have a higher concentration. Because the average tax rate for the first wage ranges is quite low due to the MLA, the elasticity produces a higher-than-necessary value. 2) Relying on various assumptions concerning the marital status and number of children of wage-earners affects both the MLA base and the tax amount to be paid through the MLA base.

[18] In terms of countries, Girouard and André (2005) found the income tax elasticity coefficient 1.9, 2.3, 2, 2.2, 2.1, 1.6 and 1.3 for the US, Germany, Italy, Austria, Spain, Belgium and Sweden, respectively. Bezděk et al. (2003) estimated the elasticity for the Czech economy to be 2.2.

[19] Potential output is obtained by using the Hodrick Prescott filter. For further information on this subject, see Hodrick & Prescott (1980).

[20] The estimation is done for 1987q1-2006q4 due to data restriction. A constant term was initially added to the equation, but later removed from the model after being found statistically insignificant. To represent the economic crisis that occurred in 2001, a dummy variable was added to the model, which however was found to cause no significant change in the elasticity value. To have them seasonally adjusted and stationary, series of first differences were used in the model. There is no autocorrelation problem for the model. Yet, the problem of heteroskedasticity is observed.

[21] For some countries, Girouard & André (2005) found the following elasticity coefficients: 0.9 for Greece, Spain and Italy, 0.7 for the US, Germany, France, Canada, Sweden, and Poland, 0.6 for Japan, Korea, Switzerland and Finland. This study estimated the elasticity average for OECD, euro area and new EU members to be 0.7.

Given that wage revenues and non-wage revenues account for 60% and 40%, respectively, of income tax collection, separate elasticity estimates are provided for each income tax categories. Accordingly, the elasticity estimate for non-wage revenues is calculated based on the progressive income tax tariff of 2008 and on the tax base information coinciding with each tax bracket.[22] The elasticity value estimated in this way is found to be 1.2.

4.1.2- Corporate Tax

When estimating the elasticity for corporate tax, the elasticity value was found theoretically rather than econometrically.[23] A two-stage method was used based on the OECD approach. As corporate tax is subject to the flat-rate tax system, the elasticity value between tax proceeds and tax base (company profits) becomes unit elastic.[24] Therefore, total corporate tax elasticity depends on company profits' sensitivity to output gap. Hence, following Girouard and André (2005), the elasticity of corporate tax relative to output gap is calculated based on the profit/GDP ratio (KP) and the elasticity of wage payments with respect to output gap $(\varepsilon_{wl,y})$. The profit/GDP ratio is described as the share of gross operating surplus in output level. Because the latest operating surplus data available are for 2006, the profit/GDP ratio of this year is taken as 50% for the elasticity estimation.[25] Depending on the result discussed in the previous section, the sensitivity of wage payments relative to output gap is included at 0.8 in the calculation. Based on these figures, the elasticity of corporate tax with respect to output gap $(\varepsilon_{t,y})$ is found to be 1.2 using the formula below:[26]

$$\varepsilon_{t,y} = \left(1 - \left(1 - KP\right) * \varepsilon_{wl,y}\right) / KP$$

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[22] The income tax tariff to be imposed on both wage and non-wage incomes in 2008 is determined as follows: 15% for up to 7800 TL; 1170 TL for 7800 TL of 19800 TL and 20% for over 7800TL, 3570 TL for 19800 TL of 44700 TL and 27% for over 19800 TL, 10293 TL for 44700 TL and 35% for over 44700 TL.

[23] The complicated structure of the corporate tax, the frequent changes in regulations, the fact that companies pay taxes when they make a profit but are not reimbursed when they make a loss, and the ability of companies to deduct past losses from future profits make the elasticity calculation unable to use econometric estimation methods.

[24] The corporate tax rate is 30% for 2003 and 2005, 33% for 2004 and 20% for 2006-2010.

[25] The older GDP series-related operating surplus data released by TURKSTAT are extracted as surplus from the gross domestic product calculated via the production method. In this sense, they include the statistical error. Considering this fact, when estimating the elasticity of Turkey, Girouard and André (2005)'s profit/GDP ratio for new EU members is taken at an average of 44%. Yet, this has not led to a significant difference in the elasticity value.

[26] Girouard and André (2005) calculated the elasticity of corporate tax with respect to output gap at an average of 1.5 for OECD countries and 1.4 for the euro area and new EU members.

4.1.3- Indirect Taxes

Our elasticity estimation for indirect taxes is based on the European Central Bank methodology but the OECD methodology is also applied and the results from both estimation methods are found to be similar. With regard to the European Central Bank methodology, the relationship between indirect taxes and macroeconomic variables (tax base) is estimated directly by using the LSM. In the OECD methodology, a two-stage approach is followed, where the elasticity between tax proceeds and tax base is assumed to be unit elasticity[27] and the relationship between tax base and economic activity (output level) is estimated by the two-stage LSM considering the problem of simultaneity between variables.

The relationship between indirect taxes (T_{dv}) and macroeconomic variables (for tax base, resident and nonresident households' domestic consumption and public spending on goods and services are selected) is estimated by the LSM using the following equation:

$$\partial \ln(T_{dv}) = \varepsilon_{t,c} \partial \ln(C_t) + u_t$$

Estimate results show that the short-term elasticity coefficient $(\varepsilon_{t,c})$ is 0.94 and this value is statistically significant.[28] This figure is close to the indirect tax elasticity value commonly accepted as 1 in the literature.[29]

The relationship between the tax base formulated for indirect taxes as per the OECD methodology (resident and nonresident households' domestic consumption + public spending on goods and services) and economic activity is estimated by using the two-stage LSM as shown in the equation below.[30]

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[27] It should be noted that the elasticity assumption regarding indirect taxes is a rather broad assessment. Because indirect taxes cover not only VAT, which is based on proportional taxation, but also SCT, which is based on both proportional and fixed taxation as per various items. In addition, indirect taxes include other tax items such as banking and insurance taxes, special communication tax, and stamp duty. Moreover, the overall VAT rate implemented in Turkey is 18%, but for the delivery of some goods and services, this rate is 1% and 8%.

[28] The equation is estimated for the 2000q1-2009q4 period. A constant term was initially added to the equation, but later removed from the model after being found statistically insignificant. The study uses seasonally adjusted series. Series of real, logarithmic form and of first differences (to make them stationary) are included in the equation. When making indirect taxes real, a deflator is used for resident and nonresident households' domestic consumption and public spending on goods and services. There is no autocorrelation or heteroskedasticity problem. We have also checked if any cointegration has existed between series but found no such relation as of the period in question.

[29] While Giorno et al. (1995) measured unit elasticity for indirect taxes, Van den Noord (2000) estimated the relationship between private consumption and output level in an econometric fashion (two-stage LSM) via the OECD methodology and found the average elasticity for selected OECD countries to be 0.9.

[30] The equation is estimated for the 2000q1-2009q4 period. A constant term was initially added to the equation, but later removed from the model after being found statistically insignificant. Seasonally adjusted series are

$$\partial \ln\left(C_t / Y_t^*\right) = \varepsilon_{c,y} \partial \ln\left(Y_t / Y_t^*\right) + u_t$$

The estimate results are statistically significant and the elasticity coefficient $\left(\varepsilon_{c,y}\right)$ is found to be 0.81.[31] This value is below the value found using the previous method but the difference between these two values is not much.

4.1.4- Weighted Tax Elasticity Coefficient

Table 1 gives a brief overview of tax elasticity with respect to each tax category.

Table 1: Measuring Tax Elasticity for Each Type of Income				
Type of Income	Tax Base	Elasticity of tax proceeds with respect to tax base	Elasticity of tax base with respect to output gap	Total elasticity
		A	B	A*B
Income Tax (Wage)	Labor payments	2.0	0.8	1.5
Corporate Tax	Operating surplus	1.0	1.2[*]	1.2
Indirect Tax	Private consumption[**] + Public spending on goods and services	1.0	0.8	0.8

*Estimation based on the assumption that the profit/GDP ratio is 50%.

** Based on resident and nonresident households' domestic consumption.

The weighted tax elasticity coefficient is obtained by weighting the elasticity values estimated for each tax category (4 different income items) by the share of each income item in total tax revenues. Assuming that the elasticity values calculated above are valid for 2009 and based on the Central Government Budget figures for 2009, the weighted tax elasticity coefficient calculation is shown in Table 2. Accordingly, the weighted tax elasticity

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used. Series of first differences (to make them stationary) are included in the model. There is no autocorrelation problem.

[31] As instrument variable, the investment to potential output ratio $\partial \ln\left(I_t / Y_t^*\right)$ is used by copying the Bezděk et al. (2003) study made for the Czech economy. According to the estimate result reached by the LSM, the elasticity coefficient is found to be 0.82.

coefficient is calculated to be 1.07. As it can be clearly seen in Table 2, the most important factor determining the weighted tax elasticity coefficient are indirect taxes that account for 66% of total tax revenues.

Table 2: Weighted Tax Elasticity for 2009		
Type of income	Elasticity	Share
Indirect tax	0.94	0.66
Income tax (wage)	1.49	0.14
Income tax (non-wage)	1.20	0.09
Corporate tax	1.20	0.11
Total tax	**1.07**	1.00

4.2-Determining Potential Output

The potential output level is obtained by using the Hodrick Prescott $(\lambda = 1600)$ filter.[32] Apart from that, referring to Öğünç & Sarıkaya (2010) that deals with the output gap estimation in Turkey, potential output figures calculated using the Bayesian method are used in structural budget balance estimates. Structural primary budget balance calculations made by using potential output figures produced by different methods have delivered similar results (Annex 1).

4.3- Calculating Cyclically Adjusted (Structural) Budget Balance

In the final stage, by using information about tax elasticity coefficients and potential output level, the cyclically-adjusted budget balance and the primary budget balance are estimated for the 2006 – 2010 period. When calculating cyclically-adjusted tax revenues $\left(T^*\right)$, for indirect taxes, the relationship between consumption (resident and nonresident households' consumption and public spending on goods and services) and its trend value $\left(C^* / C\right)$ is taken into account as per the ESCB methodology.[33] For other income items, by

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[32] In order to address the end-of-sample problem, potential GDP was calculated for the 1998q1 – 2011 q4 period by taking into account the real GDP estimates for 2011 as well, and later, the structural budget balance was calculated for 2006 –2010.
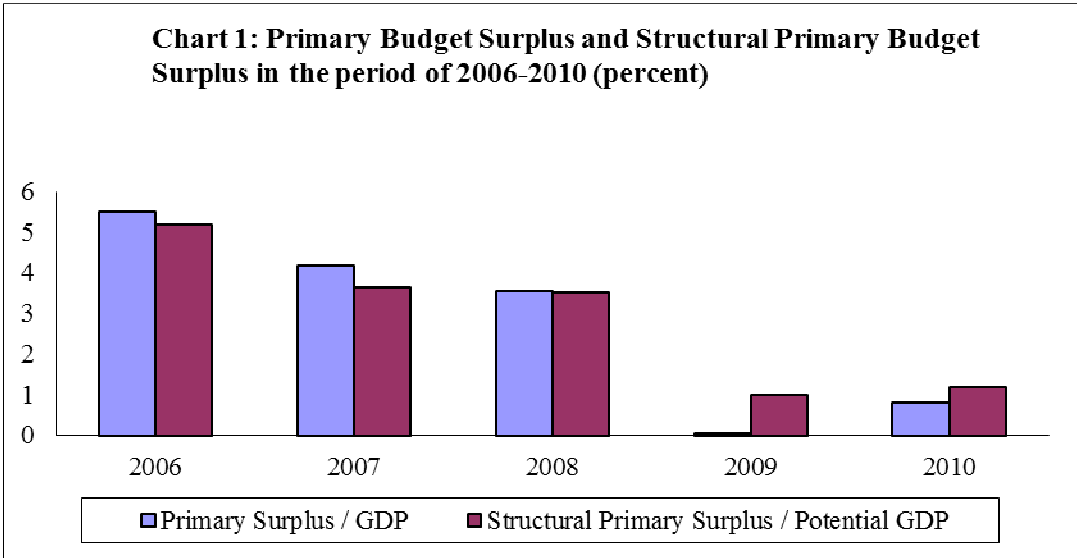
[33] To illustrate it with a formula, cyclically-adjusted indirect taxes are obtained by $T^* = T\left(C^* / C\right)^{\varepsilon_{t,c}}$ instead of $T^* = T\left(Y^* / Y\right)^{\varepsilon_{t,y}}$. C^* is obtained by using the Hodrick Prescott method. An example to the cyclically-adjusted tax revenue calculation based on the content impact for indirect taxes is Dobrescu & Salman (2011).

taking into account the relationship between output level (GDP) and potential output level (Y^*/Y) as per the OECD approach, cyclically-adjusted tax revenues are estimated.[34]

Table 3 gives a brief outline of the central government primary budget balance in two sections: cyclical and structural. Chart 1 shows an illustration of actual and structural primary budget balance. Under various elasticity assumptions made as to the fact that structural budget balance might be sensitive to the tax elasticity values in use, the extent to which structural budget figures have changed is analyzed as well. Structural primary budget balance calculations made by using various tax elasticity figures have produced similar results (Annex 2).

Table 3: Structural and Cyclical Primary Budget Balance (in % of GDP)				
	Primary Budget	Structural	Cyclical	Output Gap[*]
2006	5.5	5.2	0.3	3.4
2007	4.2	3.6	0.5	3.9
2008	3.5	3.5	0.0	1.3
2009	0.1	1.0	-0.9	-6.3
2010	0.8	1.2	-0.4	-1.3

$* \left(Y - Y^*\right)/Y^*$

Chart 1: Primary Budget Surplus and Structural Primary Budget Surplus in the period of 2006-2010 (percent)

□ Primary Surplus / GDP   ■ Structural Primary Surplus / Potential GDP

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[34] The reason for taking into account consumption rather than output to find cyclically-adjusted indirect taxes is because indirect tax elasticity estimates are made based on consumption (0.94). Yet, an estimation of cyclically-adjusted indirect tax estimation is made by using output (GDP) instead of consumption in the study, and in this context, the indirect tax elasticity with respect to output level is used (0.81). The structural budget balance calculations made by using both methods have delivered similar results (Annex 1).

While the share of primary budget balance in GDP was 3.5% and 0.1% in 2008 and 2009, respectively, the structural primary budget balance to potential GDP ratio was 3.5% and 1%, respectively (Table 3, Chart 1).[35] Primary budget surplus was 0.8% in 2010, whereas structural primary budget surplus was 1.2%.

The cyclical primary budget balance obtained by subtracting structural primary budget balance from primary budget balance is pro-cyclical with output gap (Table 3). That is, when output level exceeds potential output (i.e. if output gap gets positive, $Y > Y^*$), the actual primary budget balance follows a more positive path than the structural primary budget balance, and the opposite happens when output gap gets negative ($Y < Y^*$).[36]

5. Structural Primary Budget Surplus and Fiscal Stance

The change in the structural primary budget balance is recognized as an indicator of the discretionary fiscal policy.[37] To determine the quality of the implemented fiscal policy, i.e., to make sure whether the discretionary fiscal policy in effect is pro-cyclical or counter-cyclical requires an analysis about the state of economy (cyclical conditions). In literature, both output gap (by level) and the change in output gap are used as an indicator of the economic state. Determining the direction of the discretionary fiscal policy in effect can be sensitive to the measure of the selected economic activity; thus, this study employs both methods. Yet, it is believed that it would be healthier to determine the quality of fiscal policy with respect to the change in output gap, which is the second method.[38]

According to the first method, when the change in the structural primary budget balance[39] and the output gap (by level) take the same sign (both being positive or negative), it means that the fiscal policy is counter-cyclical. On the other hand, if both economic indicators take opposite signs, the fiscal policy is pro-cyclical. However, this approach has a major disadvantage. In a period when the economy is tighter (looser) than the previous year, the output gap may still get a positive (negative) value. Implementing an expansionary

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[35] Structural and cyclical budget balance calculations are given in Annex 3.

[36] Output gap is described as $\left(Y - Y^*\right)/Y^*$.

[37] Considering the fact that interest payments are not directly controlled by governments and are shaped by fiscal policies of past years rather than the current year, it is believed that analyzing "fiscal stance" based on the structural primary budget balance would be a healthier approach compared with the structural budget balance.

[38] For further information, see Huart (2010).

[39] In this study, budget balance is defined as (T-G). Accordingly, if the change in the structural budget balance obtained by subtracting the structural budget balance of period (t) from period (t-1) is positive (negative), the fiscal policy of the current year is tighter (looser) compared with the previous period.

(tightening) fiscal policy when the economy is tighter (looser) than in the previous year while the output gap still gets a positive (negative) value suggests that a pro-cyclical fiscal policy is followed as per the above definition. Yet, implementing an expansionary (tightening) fiscal policy when the economy tightens (eases) is expected to be counter-cyclical. In this sense, focusing on the change in output gap rather than the output gap (by level) would provide a healthier assessment. In other words, when the change in structural budget balance and the change in output gap take the same sign, it means that the fiscal policy in effect is counter-cyclical, while if both indicators take different signs, it means that the fiscal policy is pro-cyclical.

The changes in the structural primary budget balance during 2006 - 2010 can be analyzed as follows:

During 2006 – 2008, the structural primary budget surplus accounted for about 4.1% of the potential output level. In 2007, the fiscal policy was more on the expansionary side compared with the previous year. The implementation of a discretionary expansionary fiscal policy during economic easing suggests that the fiscal policy was pro-cyclical in 2007 (Chart 2). In 2007, the change in the structural budget balance was negative, while both the output gap and the change in the output gap were positive.

With respect to the primary budget balance, the fiscal policy was more expansionary in 2009 than in 2008.[40] The share of the structural primary budget surplus in potential GDP was 3.5% in 2008 but declined to 1% in 2009. The fiscal stance measured with respect to the change in the structural primary budget balance was negative in 2009, suggesting that a counter-cyclical (expansionary) fiscal policy was in place during an episode of economic tightening (Table 4, Table 5, Chart 2). Using the output gap or the change in the output gap as an indicator for the state of the economy did not affect the quality of the fiscal policy, and both indicators were negative, showing that a counter-cyclical fiscal policy was implemented in 2009.

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[40] As a result of the expansionary fiscal policy implemented in 2009, the share of the EU-defined general government nominal debt stock in GDP rose by 6 points from 39.5% in 2008 to 45.5% in 2009.

Chart 2: Fiscal Stance and Output Gap (in % of potential GDP)
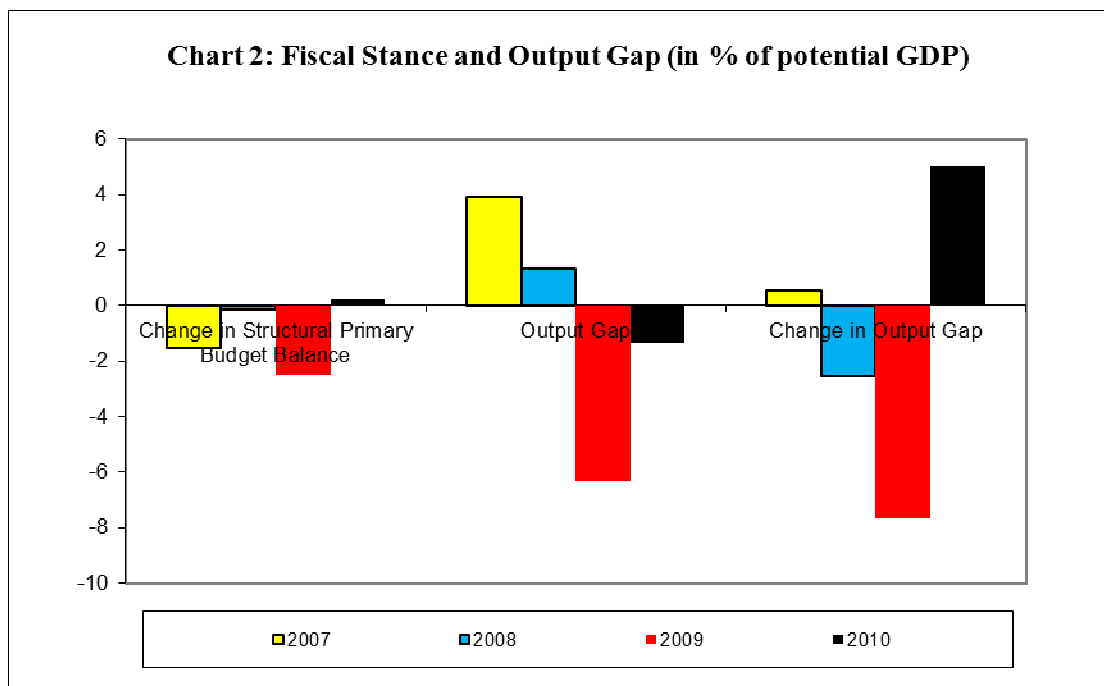
Because the economy (real GDP) tightened by 4.8% year-on-year in 2009 and output fell below potential output, some of the adverse developments in budget balances stemmed from the automatic stabilizers in the system. Accordingly, the decline in output led to a fall in tax revenues as well and this automatically had an adverse impact on budget balances. As expected, automatic stabilizers cause tax revenues to drop when the economy is tight, which may smooth the possible sharp fall in disposable income.

Table 4: Fiscal Stance and Output Gap (in % of potential GDP)			
	Structural Primary Budget Balance	Structural Primary Budget Balance (Change)*	Output Gap	Fiscal Stance**
2007	3.6	-1.5	3.9	Pro-cyclical
2008	3.5	-0.1	1.3	Acyclical
2009	1.0	-2.5	-6.3	Counter-cyclical
2010	1.2	0.2	-1.3	Acyclical

* (+) shows tight fiscal policy, (-) shows loose fiscal policy compared with the previous year.
** Counter (Pro) Cyclical: Fiscal policy in the opposite (same) direction with cyclical movements.

Table 5: Fiscal Stance and the Change in Output Gap (in % of potential GDP)			
	Structural Primary Budget Balance	Structural Primary Budget Balance (Change)[*]	Change in Output Gap	Fiscal Stance[**]
2007	3.6	-1.5	0.5	Pro-cyclical
2008	3.5	-0.1	-2.6	Acyclical
2009	1.0	-2.5	-7.7	Counter-cyclical
2010	1.2	0.2	5.0	Acyclical

* (+) shows tight fiscal policy, (-) shows loose fiscal policy compared with the previous year.
** Counter (Pro) Cyclical: Fiscal policy in the opposite (same) direction with cyclical movements.

In 2009, budget balances were shaped not only by automatic stabilizers but also by expansionary discretionary fiscal policies. For example, in order to offset the spillovers from the global crisis on domestic economy, first, a temporary cut was applied to some tax rates, particularly the Special Consumption Tax (SCT) and the Value Added Tax (VAT), and there were increases in some expenditure items.[41] In this sense, it is safe to say that the discretionary fiscal policy of 2009 implemented in line with international developments helped the automatic stabilizer to be more effective and was counter-cyclical.[42] Put differently, the fiscal policy of 2009 focused more on economic stability due to the global crisis.

In 2010, on the other hand, a less tight discretionary fiscal policy is followed compared with the previous year.[43] Among the key factors that played a role in this development were the waning effects of the one-off tax cuts put in effect during the crisis and the readjustment (increase) of the fixed taxes on fuel products as of early 2010.[44] Although the economy grew at a more robust pace (by 8.9%) in 2010 than in the previous year, output was still below potential output (i.e. output gap was still negative); therefore, the structural budget deficit is expected to be much lower than the actual budget deficit as in 2009. Yet, unlike 2009, output gets close to potential output in 2010, and, thus, the cyclical part gets smaller in size.

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[41] Some adjustments made with respect to tax cuts can be listed as follows: temporarily cut SCT on motor vehicles and on home appliances and various electronics, reduction of VAT from 18% to 8% for sales of houses over 150 m^2, new commercial spaces, furniture, IT products, machinery, hardware, and equipment. For detailed information about all revenue and expenditure measures taken against the global crisis and affecting the budget, see the SPO's "2010 Program".

[42] Haurt (2010)'s study for the EU and OECD members concludes that fiscal policies of 2009 when the global crisis hit were counter-cyclical.

[43] As a result of the tightening fiscal policy in 2010, the share of the EU-defined general government nominal debt stock in GDP dropped from 45.5% in 2009 to 41.6% in 2010.

[44] For further information on the fiscal policy of 2010, see the SPO's "2011 Program".

In 2010, the primary budget surplus to GDP ratio increased by 0.7 points year-on-year, while the structural primary budget surplus to potential GDP increased by a mere 0.2 points. The change in the structural primary budget balance that became close to 0 can be interpreted that the fiscal policy of 2010 was neither tight nor expansionary.[45] However, if the pre-crisis period is used as the reference point, the fiscal policy of 2010 was still more expansionary than that of 2008. In fact, the share of the structural primary budget balance in potential GDP went down from 3.5% in 2008 to 1.2% in 2010.

6. Conclusion

In this study, we estimated the structural primary budget balance for Turkey based on the central government budget for 2006-2010 and positioned the fiscal stance. The structural primary budget balance was obtained by using a three-step estimation method. In the first step, the tax elasticity coefficients that measure the sensitivity of tax revenues with respect to output (or output gap) were separately determined for four different tax categories. When estimating elasticity, both the legal tax structure and econometric estimation methods were used. Although we basically used the OECD approach for our calculations, we also used the ESCB method for indirect tax elasticity estimations to make comparisons. In the second step, we obtained the potential output series by using the Hodrick Prescott (HP) filter, whereby we developed the output gap series. In the final stage, we estimated the structural primary budget balance by subtracting cyclically-driven income and expenditure items from the actual primary budget balance. As a result of the structural primary budget balance calculations, the indirect tax elasticity was established at 0.94, while the elasticity of income tax on wages and of income tax on corporate tax and non-wage items were established at 1.5 and 1.2, respectively. The weighted tax elasticity coefficient calculated by taking into account the share of each tax item in total tax revenues is found to be 1.07 for 2009.

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[45] Focusing more on the sign that the change in the structural primary budget balance took rather than the extent of the change, it can be said that: the relation of the tight fiscal policy implemented in 2010 with cyclical movements differed depending on the parameter chosen as the indicator for the state of the economy. For example, an assessment made with regard to output gap reveals that a discretionary pro-cyclical fiscal policy was followed. In other words, the output gap and the change in the structural primary budget balance took opposite signs for 2010 (Table 5, Chart 3). On the other hand, focusing on the change in the output gap rather than the output gap itself suggests that a counter-cyclical fiscal policy was in place. As clearly shown in Table 6 and Chart 3, the change in the structural primary budget balance and the change in the output gap are positive. However, as stated in the text, even though the change in the structural primary budget balance is positive, it is close to 0, thus it would be more favorable to tell that the fiscal policy was neutral.

To sum up, 2009 experienced an expansionary fiscal policy to contain the spillovers from the global crisis on the domestic economy, while 2010 was marked by a gradual year-on-year decrease in budget deficits. Put differently, 2010 saw a more positive performance in terms of fiscal discipline than in 2009. However, by periods, the structural primary budget surplus to GDP ratio dropped significantly from 2006 – 2008 to 2009 – 2010.

Annex 1:

This section contains structural primary budget balance estimations and compares the results with each other by using potential output figures calculated with two different methods. This study basically uses the potential output figures obtained by the Hodrick Prescott $(\lambda = 1600)$ filter; yet, referring to Öğünç and Sarıkaya (2010), it incorporates potential output figures calculated with the Bayesian method into structural primary budget balance estimations. Structural primary budget balance calculations based on using potential output figures produced by different methods have delivered similar results (Table 6).

Table 6: Different Potential Output Levels and Structural Primary Budget Surplus				
	Structural Primary Surplus (%)[*]		Output Gap (%)	
	HP ($\lambda = 1600$)	Bayesian	HP ($\lambda = 1600$)	Bayesian[**]
2006	5.2	5.5	3.4	1.2
2007	3.6	3.9	3.9	2.3
2008	3.5	3.4	1.3	0.9
2009	1.0	1.0	-6.3	-5.9
2010	1.2	1.1	-1.3	-1.7

* In percent of potential GDP.
** Öğünç & Sarıkaya (2010)

The fact that output figures calculated by two different methods produce similar values causes the structural primary budget balance figures calculated based on those figures to deliver the same results. Here, it would be appropriate to explain the method used in calculating the structural primary budget surplus. You may recall that the structural budget balance calculation made with the HP method is based, for indirect taxes, on the relationship between consumption and its trend value (C^*/C) as per the ESCB methodology. For other income items, the structural budget balance is calculated based on the relationship between output (GDP) and potential output (Y^*/Y) as per the OECD methodology. However, the structural budget balance estimation made with the Bayesian method takes into account the (Y^*/Y) ratio for all tax items. Moreover, the indirect tax elasticity value taken into account in estimating the structural budget balance based on the ratio used differs, only by a fraction though (0.94 or 0.81).

Annex 2:

This section analyzes the extent to which the structural primary budget balance changes under various elasticity assumptions. Table 7 shows primary budget surplus figures estimated based on a weighted tax elasticity coefficient of 1.1 (main assumption), 1.2, 1.3, 1.4 and 1.5. Primary budget estimations made under various elasticity assumptions have delivered similar results.

Table 7: Different Tax Elasticity Values and Structural Primary Budget Surplus					
Structural Primary Budget Surplus (%) *					
	elasticity=1.1	elasticity=1.2	elasticity=1.3	elasticity=1.4	elasticity=1.5
2006	5.2	5.1	5.1	5.1	5.0
2007	3.6	3.6	3.5	3.5	3.4
2008	3.5	3.5	3.5	3.5	3.5
2009	1.0	1.1	1.2	1.3	1.4
2010	1.2	1.2	1.3	1.3	1.4

*In percent of potential GDP.

Annex 3:

Table 8 shows structural and cyclical budget balance calculations with respect to the central government budget balance.

Table 8: Structural and Cyclical Budget Balance (in percent of GDP, %)				
	Budget	Structural	Cyclical	Output Gap*
2006	-0.6	-1.1	0.5	3.4
2007	-1.6	-2.4	0.7	3.9
2008	-1.8	-1.9	0.1	1.3
2009	-5.5	-4.2	-1.3	-6.3
2010	-3.6	-3.1	-0.4	-1.3

$* \left(Y - Y^*\right)/Y^*$

The budget deficit made up 1.8% and 5.5% of GDP in 2008 and 2009, respectively, while the cyclically-adjusted budget deficit accounted for 1.9% and 4.2% of potential output (structural deficit). In 2010, the budget deficit to GDP ratio was 3.6%, while the structural budget deficit to potential output ratio was 3.1% (Table 8).

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